

SECTION I.—AEROLOGY.

SOLAR AND SKY RADIATION MEASURED AT WASHINGTON, D. C., DURING JULY, 1915.

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[Dated: Washington, D. C., Aug. 4, 1915.]

In Table 1 are summarized the measurements of the intensity of direct solar radiation made by the Weather Bureau at the American University,¹ Washington, D. C., during July, 1915. The means for the month are considerably lower than the 5-year means published in the Bulletin of the Mount Weather Observatory, 1912, 5:182, Table 3. On the 6th, 9th, and 18th, intensities very nearly in accord with these means were measured.

Skylight polarization, measured at solar distance 90° and in his vertical, with the sun at zenith distance 60°, averaged 45 per cent, with a maximum of 57 per cent on the 6th. This latter is the average maximum polarization for July for Washington, as published in the Bulletin of the Mount Weather Observatory, 1910, 3:114, Table 16.

In Table 2, column 2 gives the daily totals of solar and sky radiation received on a horizontal surface at the American University. The measurements were made with a Callendar recording pyrheliometer as described in the REVIEW for March, 1915, 43:100. Table 2, column 3, gives the daily departures from the normals published in the same number of the REVIEW, page 109, Table 4.

The "Percentage of possible sunshine" and the "Average cloudiness," given in columns 5 and 6 of Table 2, have been taken from the records of the observatory at the central office of the Weather Bureau.

While the above data show about the average number of hours of sunshine for July, the total radiation was below the average. The deficiency occurred in the second decade, however, as both the first and third decades show slightly more than the average amount of radiation.

TABLE 1.—Solar radiation intensities at Washington, D. C., during July, 1915.

[Gram-calories per minute per square centimeter of normal surface.]

Date.	Sun's zenith distance.									
	0.0°	48.3°	60.0°	66.5°	70.7°	73.6°	75.7°	77.4°	78.3°	80.7°
	Air mass.									
	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	6.0
1915.										
A. M.										
July 6.....	Gr.-cal. 1.39	Gr.-cal. 1.23	Gr.-cal. 1.11	Gr.-cal. 1.03	Gr.-cal. 0.95	Gr.-cal. 0.88	Gr.-cal. 0.81	Gr.-cal. 0.74	Gr.-cal. 0.66	Gr.-cal. .
9.....	1.36	1.27	1.16	1.07	1.00					
17.....		1.04	0.78	0.74						
18.....	1.35	1.17	1.04	0.94						
19.....	0.99	0.82	0.72	0.64	0.56					
21.....		1.01	0.84	0.77						
23.....		1.03	0.89	0.76	0.66	0.57	0.50	0.45	0.42	
24.....	1.16									
25.....	1.03	0.95	0.86							
26.....			0.73							
Means.....	1.22	1.06	0.90	0.85	0.79	(0.72)	(0.66)	(0.60)	(0.54)	
P. M.										
July 6.....	1.25	1.12	1.02	0.95	0.89	0.77				
24.....	1.05	0.91	0.82							
Means.....	(1.15)	(1.02)	(0.92)	(0.85)	(0.89)	(0.77)				

¹ For a description of exposures of instruments and details of methods of observation, see this REVIEW, December, 1914, 42 : 648.

TABLE 2.—Daily totals and departures of solar and sky radiation at Washington, D. C., during July, 1915.

[Gram-calories per square centimeter of horizontal surface.]

Day of month.	Daily total.	Departure from normal.	Excess or deficiency since first of month.	Percentage of possible sunshine.	Average cloudiness.
	Gr.-cal.	Gr.-cal.	Gr.-cal.	Per cent.	0-10.
July 1.....	592	68	68	78	4
2.....	547	22	90	70	6
3.....	430	— 95	—	60	8
4.....	458	— 67	—	43	9
5.....	372	—153	— 225	39	8
6.....	767	242	17	100	0
7.....	581	57	74	77	6
8.....	367	—157	— 83	43	7
9.....	758	235	152	100	1
10.....	534	12	104	64	8
11.....	337	—185	— 21	22	9
12.....	481	— 40	— 61	52	7
13.....	594	74	13	73	5
14.....	640	120	133	90	5
15.....	356	—163	— 30	24	8
16.....	366	—152	— 182	38	9
17.....	439	— 78	— 200	54	5
18.....	655	139	121	99	0
19.....	415	— 99	— 220	60	5
20.....	241	—272	— 492	0	10
Decade departure.			— 656		
July 21.....	528	17	— 475	61	4
22.....	580	70	— 405	79	4
23.....	563	55	— 350	56	4
24.....	632	130	— 224	99	0
25.....	629	124	— 100	98	3
26.....	562	59	— 41	96	3
27.....	518	17	— 24	96	5
28.....	372	—127	— 151	43	8
29.....	448	— 49	— 200	36	8
30.....	498	3	— 197	65	5
31.....	549	55	— 142	82	4
Decade departure.			350		
Total excess or deficiency since first of year.			—1,200		

NOTE ON THE DISTRIBUTION OF MOISTURE IN THE ATMOSPHERE.

By WM. R. BLAIR, Professor in Charge of Aerological Investigations.

[Dated: Weather Bureau, Washington, Aug. 3, 1915.]

In the Bulletin of the Mount Weather Observatory, volume 4, part 4, pages 194-197, the writer published tables of the absolute humidity, in grams per cubic meter, at different levels above sea. The weights are given to thousandths of a gram in these tables. The following statement is made on page 209 of the same volume: "It seems plausible that * * * the constituent, water vapor, will remain an important factor even at very high levels, etc." Since the publication of the above, inquiries have been received as to whether the accuracy of the observations, made in free balloon ascensions, justified the use of three decimal places in these tables. In answer to these inquiries it may be stated that the best proof we had at the time of the accuracy of the observations of relative humidity was the fact that, among themselves, the results of these observations are consistent. This evidence pointed to the fact that the weights obtained were qualitatively correct and were valuable in expressing the relative moisture content of the air at different levels or at different times. The expression of these relative values required the use of three decimal places in the tables. The use of at least three decimal places is also justified by the fact that at the higher levels